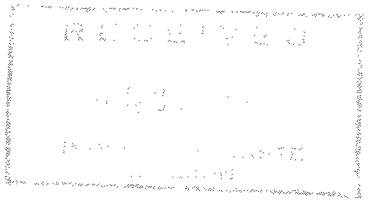

City of San Francisco
Soil Investigation Report

JAN 16th 1987
YOSEMITE FITCH.

Prepared by

ERM-West

January 1987

ERM-West
Environmental Resources Management

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Reply To:

January 16, 1987

Rancho Cordova

Mr. Steve Medberry
Division Engineer
Industrial Waste Division
750 Phelps Street
San Francisco, Ca 94124

Subject: Yosemite and Fitch Outfalls Consolidation Project: Soil Investigation Along the Route of Proposed Sewer Construction.

Dear Steve:

Enclosed are the results of the soil investigation for the subject project. Potential contamination of both soil and water has been found in various portions of the proposed sewer alignment. In the following paragraphs we will provide the background, a summary of the soil collection and analysis methodology, and recommendations for your review and consideration.

Background

In Attachment A is a letter, dated November 3, 1986, from ERM-West to the City of San Francisco, Department of Public Works, that summarizes the proposed workplan and describes the site history, analysis procedure and protocol. The soil investigation proceeded in accordance with the workplan with few exceptions. In some shallow, preliminary borings sampling with an organic vapor analyzer indicated the presents of organics and the borings were drilled deeper and samples were taken for analysis.

Soil Sampling and Analysis

ERM-West managed the project and provided environmental scientists to perform the soil sampling and logging of the borings. The driller for the project was Kleinfelder and Associates, Stockton, California. The laboratory performing the analysis was Anlab, Sacramento, California.

Soil sampling and analysis were conducted in accordance with the San Francisco Municipal Code, Chapter 10, Article 20 (Soils Analysis Code). Borings were made with a hollow stem auger and samples were taken, as required, with a 2-inch California Modified Sampler, shelby tubes, or from the drill cuttings. Samples in most cases were taken ahead of the auger in undisturbed soil.

Laboratory analysis were conducted for the following constituents:

1. Inorganic Toxic Substances (priority pollutant metals; reference EPA Test Methods for Evaluating Solid Wastes, second edition, SW-846, July 1982)

2. Volatile Organic Toxic Pollutants (Purgeable Halocarbons, EPA #8010; Purgeable Aromatics, EPA #8020)

3. Total Petroleum Hydrocarbons (EPA #8015, modified)

4. PCBs (EPA #8080)

5. pH (EPA #9040)

6. Flammability (EPA #1010)

7. Cyanides (EPA #9010)

8. Sulfides (EPA #9030)

Results of Soil Analysis

The results of the soil investigation are summarized in Table 1 for the compounds that exceed State and Federal Regulations. The complete laboratory reports for each of the borings and the samples analyzed are provided in Attachment B. Boring numbers identified in Table 1 correspond to the boring locations shown on Figure 1.

Title 22, California Administrative Code, and the Department of Health Services, Action Level Table were used as regulatory standards to compare the results of the samples for identifying whether the sample can be classified as a hazardous waste. For the metals and some of the organic compounds, Title 22 establishes the limits for hazardous waste classifications. For the purgeable organic compounds, no limits are provided by Title 22, therefore the "action levels" established by the Department of Health Services was used for comparison.

Of the 26 borings drilled, 11 boring locations indicate the presence of chemical compounds that are in sufficient concentration to potentially classify the material as hazardous waste or in excess of the action levels established by DOHS. The results of the soil investigation are from a limited number of

borings along the alignment of the proposed sewer, and that the evidence of potential contamination in any one sample is for that boring location only. The extent of the potential contamination cannot be determined, nor the level of cleanup, if required, cannot be determined without further detail investigation of ground water flow, local geology, future use of the area, with respect to both land and water, and without the full concurrence of the regulatory agencies and the City of San Francisco.

The borings, where contamination was found to exceed the above referenced regulatory standards, can be grouped into four areas within the proposed sewer alignment: Area 1 - Hawes St. between Thomas and Van Dyke Avenues (borings 2, 3, 4, and 5); Area 2 - Hawes St. and Armstrong Ave (borings "I", 7 and 8); Area 3 - Ingalls St. and Armstrong Ave (boring "G", "O", 9, and 10); and Area 4 - Bancroft Ave. straddling Griffith St. (borings 11 and 12).

Area 1 - Borings 1, 2, 3, 4, and 5. In this area, high metal concentrations (copper, lead, and nickel), that exceed Title 22 limits, were found in several soil samples. The area is underlain with a fractured rock formation that prevented drilling deeper than 30 feet. In borings 1, 2, and 3, drilling stopped at depths ranging from 15 to 30 feet; ground water was not encountered in these borings.

Some detectable concentrations of purgeable organics (PCE, TCE, Chloroform, and 1,2 Dichloroethane) were found in the soil of these borings. With these levels of purgeable organics in the soil it is possible that these compounds may be found in the ground water in the area and in concentrations that exceed regulatory requirements.

Detectable levels of cyanide were also evident in samples from borings 2 and 4. The origin of this compound is unknown.

Area 2 - Borings "I", 7, 7A, and 8. In these borings, the samples indicated metals contamination (copper, zinc, lead, and mercury) in the soil and ground water contaminated with purgeable aromatics (benzene, touluene, etc.). In boring 7, a black, aromatic product was found floating on the ground water. The float smelled like tar and was thought to be creoste or some derivative of fence treatment, since the boring is located near the site of a former lumber yard. Subsequent testing of the soil from borings 7 and 8 indicated no evidence of creosote and pentachlorophenol above a detection limit of 10 mg/kg; however, significant levels of benzene, toluene, and xylene (BTX) were detected in the groundwater.

The water sample from boring 7A was analyzed and found to contain significant levels of creosote derivatives. The concentration levels of the chemicals are shown in Table 1.

Area 3 - Boring "G", "O", 9, and 10. Evidence of purgeable aromatic contamination (benzene, touluene, etc.) was found in the ground water. A leaking diesel fuel tank to the north of Ingalls St. may be the origin of the contamination. It appears that the contamination may be following the porous backfill of a sewer in the center of Ingalls St.

Detectable levels of cyanide were found in a soil sample from boring 10. As with Area 1, the origin of this compound is unknown.

Area 4 - Borings 11 and 12. Lead and nickel levels in soil samples were detected in excess of Title 22 standards. The concentrations did not exceed the TTLC limits; however, the concentrations noted in Table 1 exceed ten times the STLC limits.

Recommendations

1. Since the soil investigation included an exploration of only a small portion of the overall sewer excavation area, and potential contamination of the soil and water were found, the construction project should proceed with care, with the awareness that potential contaminated soil and water may be encountered between the boring areas where no contamination was found.

2. Contingency plans should be developed and initiated for the time when contaminated soil or water is encountered during the construction of the sewer.

3. The excavated soil from the sewer trench should be visually inspected as the project progresses for signs of contamination. A volatile organic analyzer should be on-site, used, and maintained throughout the excavation portion of the project.

4. By areas, the specific recommendations aside from the general ones noted above, are as follows:

   Area 1 - Few metal concentrations were found that potentially exceed STLC limits; therefore, construction may proceed in this area. However, purgeable organics were uncovered in the soil, and ground water was not encountered. The potential for PCE, TCE, and other contamination is possible. If ground water is encountered in this area, a volatile organic analyzer should be used to test for presence of organics. If readings in excess of 100 are detected, then further sampling and analysis should be performed on the material.

   Area 2 - Construction should not proceed in this area until further investigations are conducted. Specifically, more borings will be drilled to determine

the extent of the groundwater contamination by creosote around boring 7A (adjacent to boring 7). The fuel contamination around boring I is not significant enough to warrant cleanup. An additional boring will be made to verify level.

Area 3 - Construction may proceed in this area since total hydrocarbons are less than 10 mg/l.

Area 4 - Few metal concentrations were found that potentially exceed STLC limits; therefore, construction may proceed in this area.

5. If contaminated water is encountered in the excavation in any area, the potential for the sewer to act as a conduit for the contamination is great. Barriers across the sewer alignment should be constructed to stem the potential for contaminant transport through the sewer backfill. As a minimum barriers should be considered between areas 1 and 2, 2 and 4, and between boring locations "O" and 9.

6. If contaminated soils in the water bearing strata are removed from area 2, 5,700 cubic yards would require disposal at a class 1 disposal site. These estimated volumes of contaminated soil is assumed removed from the trenching operation only and does not include soil outside the excavation. Contaminated ground water would require approved treatment and disposal.

Please call if you have any questions or require further discussion or interpretation of the results.

Very truly yours,

ERM-West

Dennis Miller

for Daniel Hinrichs
Principal Engineer

DM/204

Enclosure - Noted

cc: Melita Elmore
Dennis Miller